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EXAMINER

TORRES, JUAN A

ART UNIT PAPER NUMBER

2631

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/066,966	Applicant(s) YUAN ET AL.	
	Examiner Juan A. Torres	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 15-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03-04-02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 1-13 are objected to because of the following informalities: in line 11 of claim 1 the recitation "the asymmetric" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "an asymmetric". Appropriate correction is required.

Claims 2-13 are objected to because of the following informalities: in line 3 of claim 2 the recitation "the first bit" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "the first bit estimate" (see claim 15). Appropriate correction is required.

Claims 2-13 are objected to because of the following informalities: in line 3 of claim 2 the recitation "a third bit" is improper because claim 3 will not have antecedent; it is suggested to be changed to "a third bit value" (see claim 3). Appropriate correction is required.

Claims 2-13 are objected to because of the following informalities: in line 4 of claim 2 the recitation "the first bit" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "the first bit estimate" (see claim 15). Appropriate correction is required.

Claims 2-13 are objected to because of the following informalities: in line 5 of claim 2 the recitation "the value" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "a value". Appropriate correction is required.

Claims 4-13 are objected to because of the following informalities: in line 2 of claim 4 the recitation "the group" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "a group". Appropriate correction is required.

Claims 6-13 are objected to because of the following informalities: in lines 5, 6, 7, 9, 10, 11 of claim 6 the recitation "if" is improper because its render indefinite to the claims; it is suggested to be changed to "when".

For the same reason it is suggested to change the recitation "if" in all the claims to "when"; for example in claim 17 lines 5, 7, 9; claim 185, 7, 9, etc...

Appropriate correction is required.

Claims 6-13 are objected to because of the following informalities: in line 4 of claim 6 the recitation "below first" is improper; it is suggested to be changed to "below the first". Appropriate correction is required.

Claims 7-13 are objected to because of the following informalities: in lines 4 and 5 of claim 7 the recitation "input voltage the second and third bits have "0" values" is improper; it is suggested to be changed to "input voltage when the second and third bits both have "0" values" (see claim 6 lines 4-5). Appropriate correction is required.

Claims 10-12 are objected to because of the following informalities: in lines 8 of claim 10 the recitation "the FEC corrections" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "FEC Corrections" (see claim 6 lines 4-5). Appropriate correction is required.

Claim 13 is objected to because of the following informalities: in lines 3 of claim 13 the recitation "the ratio" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "a ratio". Appropriate correction is required.

Claims 17-29 are objected to because of the following informalities: in lines 5, 7 and 9 of claim 17 the recitation "if" is improper because its render indefinite to the claims; it is suggested to be changed to "when".

Claims 18-29 are objected to because of the following informalities: in lines 5, 7 and 9 of claim 18 the recitation "if" is improper because its render indefinite to the claims; it is suggested to be changed to "when".

Claims 21-29 are objected to because of the following informalities: in lines 4-5 of claim 21 the recitation "the mean" is improper because its render indefinite to the claims; it is suggested to be changed to "a mean".

Claim 28 is objected to because of the following informalities: in lines 3 of claim 28 the recitation "the ratio" is improper because it is not antecedent in the previous claims; it is suggested to be changed to "a ratio". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In line 2 of claim 2 the recitation "the first bit estimate" is improper because it is not antecedent in the previous claims. Claim 1

doesn't estimate the first bit, only establish the threshold but doesn't make the estimation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Lu (US 5896422). Lu discloses receiving a non-return to zero (NRZ) data stream input (figure 6 block 100 column 7 lines 42-56 and column 9 lines 13-29); establishing thresholds to distinguish a first bit estimate (figure 6 block 144 column 7 lines 42-56, column 9 lines 13-29 and column 13 lines 22-51); tracking the NRZ data stream inputs in response to sequential bit value combinations (figure 6 blocks 108, 130, 136 and 142 column 7 lines 42-56 column 9 lines 13-29); maintaining long-term averages of the tracked NRZ data stream inputs (figure 6 blocks 108, 130, 136 and 142 column 7 lines 42-56 and column 9 lines 13-29); adjusting the thresholds in response to the long-term averages (figure 6 block 144 column 7 lines 42-56 and column 9 lines 13-29 and column 13 lines 22-51); and offsetting the threshold adjustments to account for the asymmetric noise distribution (figure 6 block 144 column 7 lines 42-56 and column 9 lines 13-29 and column 9 lines 51-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shefer (US 5850357), and further in view of Lu (US 5896422). Shefer discloses in a communications system, a method for non-causal channel equalization system; and a non-causal circuit having inputs to accept bit estimates from the multi-threshold decision circuit, the non-causal circuit comparing a current bit estimate to bit value decisions made across a plurality of clock cycles, the non-causal circuit having an output to supply a bit value for the current bit estimate determined in response to the non-causal bit value comparisons (figure 3 column 5 lines 23 to column 6 line 16). Sheter doesn't disclose a multi-threshold decision circuit having an input to accept a non-return to zero (NRZ) data stream, an input to accept threshold values, and outputs to provide bit estimates responsive to a plurality of voltage threshold levels; and a threshold circuit having an input to accept bit values, an input to accept the NRZ data stream, and outputs to supply threshold values to the multi-threshold circuit that are adjusted in response to asymmetric noise in the NRZ data stream. Lu discloses a multi-threshold decision circuit having an input to accept a non-return to zero (NRZ) data stream, an input to accept threshold values, and outputs to provide bit estimates responsive to a plurality of voltage threshold levels (figure 6 block 144 column 7 lines 42-56, column 9 lines 13-29 and column 13 lines 22-51); and a threshold circuit having an input to accept

Art Unit: 2631

bit values, an input to accept the NRZ data stream, and outputs to supply threshold values to the multi-threshold circuit that are adjusted in response to asymmetric noise in the NRZ data stream (figure 6 block 144 column 7 lines 42-56 and column 9 lines 13-29 and column 9 lines 51-65). Sheter and Lu are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the non-causal channel equalization disclosed by Sheter the adaptive threshold disclosed by Lu. The suggestion/motivation for doing so would have been to reduce the bit error rate setting a bit determination threshold for determining the logic state of a bit in a data bit stream of an NRZ signal (Lu abstract). Therefore, it would have been obvious to combine Sheter with Lu to obtain the invention as specified in claim 14.

Allowable Subject Matter

Claims 15-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: claims 15-30 are allowed because the references cited fail to teach, as applicant has, comparing a first bit estimate in the NRZ data stream to a second bit value received prior to the first bit, and a third bit received subsequent to the first bit; and, in response to the comparisons, determining the value of the first bit, as the applicant has claimed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Leung (US 6493329) discloses in figure 3 an adaptive non-causal channel estimator 302 in an adaptive channel estimation wireless communication system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Juan Alberto Torres
4-27-2005

TESFALDET BOGURE
PRIMARY EXAMINER

